

Recommendations for System Support Capability

Deliverable #23

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1 INTRODUCTION

This document presents the Recommendations for System Support Capability for the Health Insurance Organization's (HIO) newly-implemented Management Information System (MIS). This HIO MIS is being developed under contract to the U.S. Agency for International Development. This document makes recommendations for a support system that will ensure the HIO MIS is "sustainable, [and that] procedures for reporting and resolving problems, requesting maintenance, and contributing enhancement ideas [are] clearly defined."

The mechanism for system support capability will be a help desk that assists HIO MIS users. The help desk will be staffed by HIO personnel, with initial support from contractor staff as needed. This staff will be responsible for resolving problems arising from the use of the HIO MIS at the facility, branch, and Headquarters (HQ) MIS Center levels. To facilitate the help desk's work, an automated system will report, track, and monitor the resolution of reported problems. The structure and function of the help desk are discussed in this document.

The performance goals of the help desk are to:

- o provide the support necessary to guarantee that the MIS is fully functional and operational for at least 99% of its regularly-scheduled operating hours, and
- o to resolve all reported problems within 48 hours.

These goals pertain to all application, software, hardware, and telecommunications functions of the system. Performance towards these goals will be measured by reports produced by the automated tracking system, as all problems will be reported and documented using this automated system.

To achieve these goals, the help desk will:

- o Respond to and resolve reported user problems related to the application, software, hardware, and telecommunications functions of the system.
- o Use an automated system to track and monitor reported problems.
- o Respond to reports of hardware and telecommunications problems, and determine if they require external repair services.
- o Conduct monthly meetings with appropriate staff at facilities, branches, and the HIO MIS Center to discuss recurring problems and their resolutions. **This is a critical activity. Through these meetings, solutions to recurring problems can be communicated. As the solutions become common knowledge among users,**

the need for assistance from the help desk will be reduced, and overall user satisfaction will increase.

- o Ensure that its working hours correspond directly to the working hours of MIS users.

The help desk will provide version control support for software and application modifications. Version control ensures consistent and timely distribution of changes in applications and software. Version control will be the responsibility of the help desk as outlined in the Version Control Plan presented in Appendix A.

The following sections of this document outline a structure and plan for an MIS support system that, through a help desk and standardized procedures, can keep the HIO MIS running efficiently.

2 ORGANIZATION AND STAFFING REQUIREMENTS

Help desk procedures are designed to resolve problems using staff closest to the problem whenever possible. This reduces both unnecessary steps and resolution time. If a problem cannot be solved at its location, it is referred to the next level of expertise, all the way to the HQ MIS Center, if necessary. For example, login problems at a facility will be reported first to the Computer Operator at that facility. If that person is unable to resolve the problem within one hour, the branch help desk will be contacted. If branch staff is unable to resolve the problem within one day, it will be reported to the HQ MIS Center help desk. Exhibit 2-1 illustrates the flow of problem reporting from the facility level through to Headquarters, and shows how resolutions will first be sought at the level closest to the problem.

This section describes the specific duties and responsibilities of those individuals — by position at the facility, branch, and Headquarters levels — charged with providing system support for the HIO MIS. While this section does not discuss staffing requirements* (e.g., numbers or qualifications), it is important to reemphasize here that **all system support staff positions must have an assigned and trained backup in case of absence.**

2.1 Support Capabilities at the Facilities

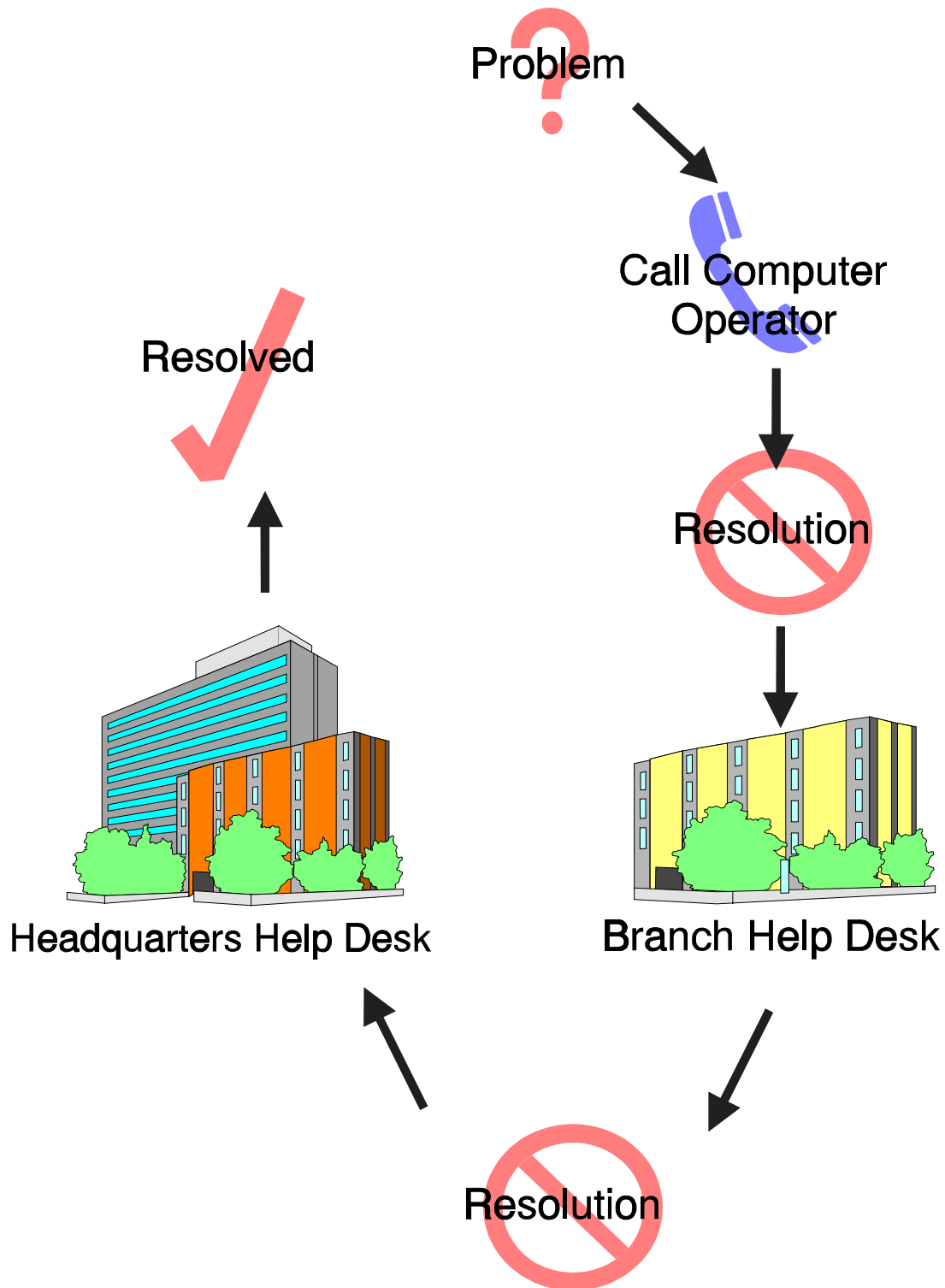
Many problems at facilities will be user errors which can be resolved immediately and on-site without contacting the branch help desk. User errors pertain to the function and use of the MIS and the equipment. The Computer Operator at each facility is responsible for making an initial attempt to resolve problems reported by facility end users. Problems not resolved within one hour by the Computer Operator at the facility will be reported to the branch.

The Computer Operator will:

- o Provide initial troubleshooting in an attempt to resolve the problem.
- o Report problems to the branch help desk when necessary, and follow up their resolution with both the branch Technical Specialists and the user reporting the problem.
- o Become aware of resolutions to commonly-reported problems.

Detailed descriptions of help desk staff positions can be found in the deliverable document "Recommended Organizational Structure for Information Systems within the Health Insurance Organization" (February 1996).

- o Meet monthly with the assigned Technical Specialist to review recurring problems and their resolutions.



It is anticipated that the Computer Operator at the facility, having received training in the application, software, and hardware, will be able to troubleshoot and solve basic problems. In cases where the Computer Operator is unable to resolve a problem, he/she will contact the branch help desk.

2.2 Support Capabilities at the Branch Computer Department

The Branch Computer Department has a number of functions. These include computer operations, training, and systems support. This section discusses the system support (or help desk) responsibilities of the Branch Computer Department.

The branch help desk is responsible for responding to all unresolved problems reported by the Computer Operators at the branch's facilities. It is also responsible for responding to problems reported by computer end users at the branch itself. A branch help desk must maintain the same operating hours as its facilities.

We recommend that approximately four facilities be supported by one Technical Specialist—End User Support. **A Technical Specialist and a backup must be assigned to each shift operated by a facility.** In addition, all hospitals in a branch will be grouped under one Technical Specialist for each operating shift. This assignment will allow users to work consistently with a specific Technical Specialist: A facility's Computer Operator will always contact the same Technical Specialist for help resolving problems. The Technical Specialist assigned to that facility grouping will be its spokesperson and supporter in all activities related to the help desk. While this is the recommended approach, if this becomes unmanageable, problem report calls will be assigned to the next available branch Technical Specialist.

In addition to the Technical Specialists—End User Support, we recommend that each branch have two Technical Specialists—Hardware/Telecommunications Support to respond to hardware and telecommunications problems. These Technical Specialists should also work in shifts to cover the operating hours of all facilities in the branch.

2.2.1 Technical Specialist—End User Support

The Technical Specialist—End User Support is the branch help desk point of contact for the facility Computer Operators and branch end users reporting a problem. When the Technical Specialist is not able to resolve the problem he/she must work with the appropriate technical staff at the branch or Headquarters to resolve it. The Technical Specialist is accountable for ensuring that all problems reported by an end user in his/her facility group are resolved in a satisfactory and timely manner. He/she will:

- o Work with the facility Computer Operators and branch end users to resolve issues reported to the branch help desk.

- o Enter reported problems into the automated system and update the system when they are resolved.

- o Generate daily and weekly problem reports listing all reported problems.
- o Contact and work closely with AT&T, ARENTO, and EgyptNet to resolve all hardware and telecommunications problems.
- o Inform the Computer Operator reporting the problem of the resolution status.
- o Recommend additional or refresher training as the need arises.
- o Meet weekly with the other technical specialists to review recurring problems and their resolutions.
- o Meet monthly with the HQ MIS Center help desk staff to review recurring problems, resolutions, and enhancement plans.
- o Distribute resolutions to commonly-reported problems to the facilities as they are developed.
- o Contact the Headquarters help desk immediately to report programming bugs and other problems unresolvable by the branch Technical Specialists.

The technical specialists must "take ownership" of problems reported to them and follow up with the appropriate staff and end users until they are resolved.

2.2.2 Help Desk/Training Coordinator

The Help Desk/Training Coordinator is responsible for the oversight of all branch help desk operations. He/she will:

- o Supervise the Technical Specialists, and assign them to facilities and shifts as required.
- o Review daily and weekly problem reports from the automated system.
- o Work with AT&T, ARENTO, and EgyptNet to resolve outstanding hardware and telecommunications problems.
- o Meet weekly with the Technical Specialists to review recurring problems and their resolutions.
- o Meet monthly with the HQ MIS Center help desk staff to review recurring problems, resolutions, and enhancement plans.

- o Meet quarterly with the HQ MIS Center training staff to schedule trainings on resolutions to commonly-reported problems.

- o Meet quarterly with Documentation Specialists to provide input into documentation in areas of frequently-reported problems.

The Help Desk Coordinator must also work with his/her assigned Help Desk Specialist at the HQ MIS Center. He/she must ensure that the HQ MIS Center help desk staff is made aware of all unresolved problems within one day of being reported and that the Headquarters staff is working to resolve them.

2.3 Support Capabilities at the HIO Headquarters MIS Center

The HQ MIS Center help desk staff is responsible for resolving all problems not corrected at the facility and branch levels. Most problems brought to the attention of the Headquarters help desk will require high-level technical expertise to resolve.

The Headquarters help desk staff is responsible for managing a problem through to resolution, although the assistance of technical staff (programmers/analysts, database administrators, etc.) may be needed. Technical staff at the HQ MIS Center must make any programming and/or application modifications necessary to resolve a problem. The Help Desk Coordinator must monitor priorities and, through the Production and Development Managers, ensure that technical fixes are being handled in a timely manner.

After testing the modifications, the help desk staff is responsible for distributing these modifications to the facilities and branches as discussed in the Version Control Plan presented in Appendix A. Any requests for enhancements will be evaluated by the MIS Steering Committee (discussed in Section 2.3.3) for appropriateness and then prioritized for inclusion in the next software or application release.

The Help Desk Coordinator at Headquarters is responsible for all activities associated with the help desk and works with his/her Help Desk Specialists to resolve all problems reported to the HQ MIS Center.

2.3.1 Help Desk Specialist

The point of contact at the HQ MIS Center help desk for the branch Technical Specialists will be the Help Desk Specialist assigned to that branch. Just as facilities are assigned to a specific branch technical specialist, a branch is assigned to a specific HQ Help Desk Specialist. Help Desk Specialists will:

- o Respond to and coordinate with the branch Help Desk/Training Coordinator to resolve problems raised to the HQ MIS Center help desk.

- o Meet monthly with the branch technical specialists to review recurring problems and their resolutions.
- o Work with the Headquarters training staff to develop training materials which address commonly-reported problems.
- o Review daily and weekly problem reports from the automated system, and take action to resolve unresolved problems.
- o Update the automated system with the problem resolution status and inform the user reporting the problem, the facility Computer Operator, and the responsible Technical Specialist of this status.
- o Inform the HQ MIS Center Help Desk Coordinator immediately when a problem requires the expertise of the Headquarter's technical staff.
- o Work with the Documentation Specialists at Headquarters to document resolutions to commonly-reported problems. This information can then be distributed to the branch help desk staff and where appropriate, to Computer Operators.

The Help Desk Specialists are required to attend MIS Steering Committee meetings when system enhancements are discussed. This is important as they are most familiar with the applications and with the operating difficulties resolvable by the potential enhancements. Guidelines for enhancements will be developed by this committee.

We also recommend that a quarterly user newsletter or bulletin be written by the Publications Manager with input from the Help Desk Specialists. This newsletter would present resolutions to commonly-reported user errors, status updates on enhancement requests, and status updates on system modifications. This newsletter would be distributed to each facility for posting in a public location, possibly in the Computer Department.

2.3.2 Help Desk Coordinator

The HQ MIS Center Help Desk Coordinator has overall functional responsibility for all activities of the help desk at the HQ MIS Center, the branches, and the facilities. This person reports directly to the Production Manager. He/she is also responsible for interacting with AT&T, ARENTO, and EgyptNet to resolve hardware and telecommunications problems that cannot be resolved at the branch.

The Help Desk Coordinator will be responsible for all activities associated with resolving problems reported by MIS users. He/she will ensure that all problems are resolved in a satisfactory and timely manner. This requires working with all technical staff at the HQ MIS Center.

2.3.3 MIS Steering Committee

We recommend that a steering committee be established to provide guidance and direction for modifications to the HIO MIS. The MIS Steering Committee will approve changes, enhancements, and updates to the HIO MIS and to policies governing its use. This committee should be under the leadership of the User Coordination/Configuration Manager. The steering committee should be comprised of polyclinic, hospital, store, branch, and Headquarters MIS users; branch technical specialists; Help Desk Specialists; Systems Support Manager; User Support Manager; and the HQ MIS Center Director. The MIS Steering Committee should meet at least quarterly to discuss the future direction of the HIO MIS.

3 PROBLEM REPORTING AND RESOLUTION PROCEDURES

The flow of problem reporting and resolution is designed to maximize the time the MIS is operational for all users at all sites. This is accomplished by immediate problem review by designated staff where the problem is reported, and immediate notification of more specialized or technical staff when necessary to resolve the problem.

The first point of contact when a problem is reported by an end user is the facility and branch Computer Operators. After notification of a problem, a Computer Operator should perform an initial assessment to determine what type of problem is reported. This initial assessment allows help desk staff to perform the steps necessary to resolve the problem in the most efficient manner possible.

It is anticipated that five types of problems will be reported:

1. **User Errors** occur when a user is not able to recognize correctable problems with the equipment or system. Examples of this type of problem are the inability to log on because the terminal is not plugged in or has not been turned on, not being able to print because there is no paper in the printer, or other similar problems. The Computer Operator at the facility will be able to correct the majority of these problems and in time they should no longer occur.
2. **Operational Errors** are mistakes users make when they use the system incorrectly. Examples of this type of problem are downloading an incorrect file, updating the wrong table, or other similar problems. The Computer Operator at the facility can correct some of these problems immediately or will be directed by the technical specialists on corrective steps needed to resolve others.
3. **Bugs** are programming errors which users encounter during normal use of an application. Examples of this type of problem are the inability to enter data, reports showing inaccurate data, or other similar problems. The Computer Operator will report these problems to the branch within one hour. Depending on the specifics of the problem and the staff knowledge and training at the branch, these problems may be resolved by the branch help desk staff, though most will be reported to the HQ MIS Center help desk for resolution by Headquarters technical staff.
4. **Enhancements** are recommendations for changes that would allow easier use of the system or greater benefit. All enhancement requests will be reported to the Help Desk Specialists at Headquarters who will submit them to the MIS Steering Committee for quarterly review.

5. **Hardware or Telecommunications Problems** pertain to the equipment and telecommunications lines used by the MIS. Examples of this type of problem include broken equipment, downed telecommunications lines, modem problems, or other similar problems. These problems will be referred to the branch Technical Specialists—Hardware/Telecommunications Support within one hour of being reported.

Problems classified as one type initially may later be reclassified as another type after technical staff attempts to resolve the problem. For example, a problem initially thought to be a user error may be a bug after closer examination.

The following describes the steps taken in the problem resolving process. The automated system is discussed in Section 4.

1. An end user calls the Computer Operator to report a problem.
2. The Computer Operator makes an initial attempt to resolve the problem if it is a user or operational error. If the problem cannot be resolved or is immediately recognized as a bug, the branch Technical Specialist is called within one hour.
3. The branch Technical Specialist makes a determination of the priority level of the problem using the following guidelines:
 - a. **Priority 1** indicates that the user is unable to use the system and its features (telecommunication lines, printers, and the like). If the problem is hardware related, arrangements for temporary replacement equipment should be made by the branch help desk. **These problems will be resolved within 24 hours of being reported.**
 - b. **Priority 2** indicates that the user is able to use the system but is restricted. For example, data entry functions but report generation does not. **These problems will be resolved within 48 hours of being reported.**
 - c. **Enhancements** are issues which do not affect the operation or functionality of the application, but which could be modified to allow users a more efficient way to perform a task. For example, a new menu option would allow reports to be run directly. These requests will be submitted to the MIS Steering Committee for quarterly review.
4. The branch Technical Specialist opens a problem reporting record in the automated system. Problem reporting records are not opened for problems resolved without being reported to the branch technical specialists.

5. The branch Technical Specialist reviews the Problem Resolution Table in the automated system to determine if similar problems have been reported previously. If they have, he/she should attempt to follow the resolution specified. If the problem is corrected at the branch, the record in the automated system is updated to reflect the resolution.
6. Problems not resolved by the branch help desk are reported to the HQ MIS Center Help Desk Specialists as soon as possible and at least within one day. Resolution then becomes the responsibility of the Headquarters help desk staff tasked with resolving the problem.
7. If the HQ MIS Center help desk determines that the problem is an enhancement rather than a bug, the problem type code in the record is modified in the automated system. The enhancement request will be reviewed by the MIS Steering Committee and a determination made as to the necessity and priority of the enhancement
8. The Help Desk Specialists work with technical staff at the HQ MIS Center to resolve the problem. When the problem is resolved the Help Desk Specialists must update the automated system to close the problem report.

It is important that the procedures outlined for problem reporting be followed at all times and in a consistent manner. This will allow problems to be resolved in a controlled manner and within the desired time frame. These procedures also build an experience base for resolving and even preventing problems in the future.

Problems which are not resolved within the desired time frame will be highlighted on the daily reports (discussed in Section 4.3) generated by the automated system and brought to the attention of the responsible staff. These reports will highlight recurring problems or sites with recurring problems to help focus additional training.

4 THE AUTOMATED SYSTEM

An important component of the system support capability is an automated problem reporting and tracking system. The automated system will track and monitor the resolution of problems reported by HIO MIS users. This system will be used by the branch and Headquarters staff involved in problem resolution. Use of the system will accomplish these objectives:

1. Problems will be resolved in a consistent and timely manner.
2. Recurring user errors can be tracked and future trainings can be designed to address them.
3. Problems unresolvable at the branch will be reported automatically to the Headquarters for resolution.
4. Requests for enhancements can be organized and tracked for future release updates.
5. Problem documentation is important as it will allow for trend identification.

Monitoring and resolving problems is the goal of the system support function of this project. Therefore, use of this system will be essential to the system support function of the HIO.

The overall design of the automated system will be kept simple. It will consist of a problem reporting screen, problem updating screen, and several periodic reports. This system will be developed in the existing Oracle7 environment. It will be resident on the UNIX system at the HQ MIS Center and available to the branches using SQLNet. The system is expected to be used by the branch help desk staff and the HQ MIS Center help desk staff.

4.1 Branch Computer Department Automated System Responsibilities

Problem records will be initiated in the automated system by the Technical Specialists—End User Support after they have been contacted by the Computer Operator or branch end users. If the telephone lines between the facility and the branch are not working, a paper Problem Reporting Form, shown in Exhibit 4-1, should be completed by the Computer Operator. This form can be faxed to the branch in the facilities where facsimile machines are available. If fax transmission is not possible, then the branch will be contacted as soon as the phone lines are working. If the Computer Operator's shift ends and the problem still has not been reported to the branch, then it is the responsibility of the Computer Operator of the following shift to report the problem to the branch help desk.

Exhibit 4-1

PROBLEM REPORTING FORM

Computer Operator to Complete

Computer Operator Name: _____

Problem Date: __/__/__ Time: __:__ am/pm Report to Branch Date: __/__/__ Time: __:__ am/pm

User Name: _____ User Login ID: _____ Job Function: _____

Site: _____ Branch: _____

Equipment with Problem: _____ Serial #: _____

Module with Problem: _____ Function with Problem: _____

Menu/Screen with Problem: _____

Problem Symptom (use codes or describe): _____

Frequency of Problem: 1st Occurrence / Occurs Sometimes / Occurs all the time

Error Message (write number if given): _____

Detailed Description: _____

Branch Help Desk To Complete

Initial Problem Type: User Error / Operational Error / Bug / Enhancement / HW or Telecommunication

Priority Level: 1 / 2 / Enhancement Current Status (number): _____

Branch Staff ID and Name Assigned to Resolve: _____ Estimated Time to Resolve: _____

Branch Staff ID and Name Assigned to Test Resolution: _____ Testing Status: 1 / 2 / 3

Resolution Code: _____ Resolution Note: _____

Reported to Branch Date: __/__/__ Time: __:__ am/pm

The problem is entered into the automated system through the Initial Problem Reporting Screen shown in Exhibit 4-2. After entering the information, a hardcopy of the Initial Problem Reporting Screen will be returned to the user and Computer Operator reporting the problem. Exhibit 4-3 presents the information captured on the Initial Problem Reporting Screen. Codes presented provide a general idea only of the types of codes associated with that data element. The lists presented are not exhaustive.

Any information that can be captured as a code will be to allow for ease of entry and reporting. Where appropriate, coded fields will have an "other" code with an associated unlimited-text field for entering the explanation of the "other" designation. All coded elements will allow a keyword lookup on textual information to display the available codes. Codes presented in the exhibit are suggestions only. They will be refined when the system is designed, and reviewed and updated regularly.

Problems resolved without assistance from Headquarters will be closed by the branch Technical Specialists, and the resolution indicated on the Initial Problem Reporting Screen. Branch Technical Specialists will contact their branch Help Desk/Training Coordinator if they are unable to resolve Priority 1 problems immediately. The Help Desk/Training Coordinator will then contact the Help Desk Specialist at the HQ MIS Center for prompt assistance in resolving these problems. Once a problem is reported to the Help Desk Specialists for resolution, they are responsible for updating the problem reporting system with the resolution.

To help maintain a continuous flow of information between the branch and Headquarters, the branch will generate a daily list of all reported problems and their current status. Unresolved problems will be grouped by priority and by number of days outstanding.

4.2 HIO Headquarters MIS Center Automated System Responsibilities

The HQ MIS Center will be notified of unresolved Priority 1 problems by telephone. Priority 2 problems and enhancement requests will be reported on the Problem Status Report. The Headquarters Help Desk Coordinator will review the status of all problems not resolved within 24 hours of being reported to the branch.

Once the problem is reported to the HQ MIS Center it is the responsibility of the Help Desk Specialists assigned to that branch to work closely with the Technical Specialist at the branch to resolve the problem. Updating the automated system with the resolution actions and status is the responsibility of the Help Desk Specialists. This will be done through the HQ MIS Center Problem Status Update Screen shown in Exhibit 4-4. Exhibit 4-5 presents the data elements from the HQ MIS Center Problem Status Update Screen. Codes presented provide a general idea only of the types of codes associated with that data element; the list presented is not exhaustive.

In addition, the HQ MIS Center will also create a Problem Resolution Table of all the different types of problems reported and their resolutions. This will serve as an information

resource to the both the branch and Headquarters help desk staffs. This table will be downloaded automatically to the branches weekly. The data elements for this table are presented in Exhibit 4-6.

Exhibit 4-2
INITIAL PROBLEM REPORTING SCREEN

Problem Report

Technical Specialist Name:

Problem Date: / / Time: : Report to Branch Date: / / Time: :

User Name: User Login ID: Job Function:

Site: Branch:

Equipment with Problem: Serial #:

Module with Problem: Function with Problem:

Menu/Screen with Problem:

Problem Symptom (use codes or describe):

Frequency of Problem:

Error Message (write number if given):

Detailed Description:

Problem Resolution

Initial Problem Type: Priority Level: Current Status (number):

Branch Staff ID and Name Assigned to Resolve: Estimated Time to Resolve:

Branch Staff ID and Name Assigned to Test Resolution: Testing Status:

Resolution Code:

Resolution Note:

Reported to HIO HQ MIS Center Date: / / Time: :

Exhibit 4-3 (page 1 of 2)
DATA ELEMENTS ON INITIAL PROBLEM REPORTING SCREEN

Data Element Name or Description	Override or Possible Help Codes
Problem Reported to Branch Date and Time	Current date and time
Computer Operator ID Called	
Method of Reporting Problem	P: Phone F: Fax
User Name with Problem	
User Login ID	
User Job Function	
User Site Code	
User Branch Code	
Problem Date and Time	Current date and time
Module with Problem	BR@HQ: Beneficiary Registration at Headquarters BR@BR: Beneficiary Registration at Branch BR@PC: Beneficiary Registration at Polyclinic
Function with Problem	1: Data Entry 2: Report Generation 3: Form Generation
Menu/Screen with Problem	1: Beneficiary Registration - Initial Intake 2: Beneficiary Registration - Visit Screen
Equipment with Problem	1: Monitor 2: Keyboard 3: Terminal 4: Server 5: Modem 6: Printer 7: Router 8: Other
Equipment ID with Problem	Serial Number

Problem Symptom	1: Terminal Locked 2: Can't Login 3: Can't Enter Correct Response 4: Can't Find Record 5: Data Lost/Data Wrong 6: Data Entry Quit, User Returned Back to Menu 7: Report/Form Did Not Run 8: Printer Did Not Work 9: Telecommunications Problem 10: Policy Issue 11: Suggestion/Enhancement Request 99: Other
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Exhibit 4-3 (page 2 of 2)
DATA ELEMENTS ON INITIAL PROBLEM REPORTING SCREEN

Data Element Name or Description	Override or Possible Help Codes
Frequency of Problem	1: First Occurrence 2: Occurs Sometimes When the Option is Selected 3: Each Time the Option is Selected
Error Message	List of all error messages
Detailed Description of Problem or Enhancement	Unlimited text field
Initial Problem Type	1: User Error 2: Operations Error 3: Bug 4: Enhancement Request 5: Hardware/Telecommunications
Help Desk Assigned Priority Level	1: Users cannot use system, resolve within 24 hours 2: Users are restricted on the system, resolve within 48 hours E: Enhancement Request, reviewed by the MIS Center Steering Committee
Resolution Date and Time	Current date and time
Current Status	1: In Review (initial default) 2: In Process 3: In Testing 4: Ready to Release 5: Released but Not Closed (user reported additional problem) 6: Closed 7: Enhancement Request Accepted 8: Enhancement Request Rejected 9: Cannot Be Recreated
Branch Staff ID Assigned to Resolve Problem	
Estimated Time to Resolve Problem	
Branch Staff ID Assigned to Test Resolution	
Testing Status	1: Awaiting Test 2: Passed Test 3: Failed Test
Resolution Code	1: Unable to Resolve, Reported to HIO HQ MIS Center

Resolution Note	Unlimited text field
Reported to HIO HQ MIS Center Date and Time	Date and time Resolution Code is entered

Exhibit 4-4
HEADQUARTERS MIS CENTER PROBLEM STATUS UPDATE SCREEN

(Display Only)

Problem Detailed Description: _____

Priority Level:

Problem Date: / / Time: : Report to Branch Date: / / Time: :

Reported to HIO HQ MIS Center Date: / / Time: :

HIO HQ MIS Center Help Desk To Complete

Current Status (number):

HQ Staff ID and Name Assigned to Resolve: _____ Estimated Time to Resolve: _____

HQ Staff ID and Name Assigned to Test Resolution: _____ Testing Status:

Resolution Date: / / Time: :

Resolution Code:

Resolution Note: _____

Exhibit 4-5
DATA ELEMENTS FROM THE HEADQUARTERS MIS CENTER
PROBLEM STATUS UPDATE SCREEN

Data Element Name or Description	Override or Possible Help Codes
Resolution Date and Time	Current date and time
Current Status	1: In Review (initial default) 2: In Process 3: In Testing 4: Ready to Release 5: Released but Not Closed (user reported additional problem) 6: Closed 7: Enhancement Request Accepted 8: Enhancement Request Rejected 9: Cannot Be Recreated
HIO HQ MIS Center Staff ID Assigned to Resolve	
Estimated Time to Resolve Problem	
HIO MIS Center Staff ID Assigned to Test Resolution	
Testing Status	1: Awaiting Test 2: Passed Test 3: Failed Test
Resolution Code	1: Application Modification Required 2: Software Modification Required
Resolution Note	Unlimited text field

Exhibit 4-6
PROBLEM RESOLUTION TABLE DATA ELEMENTS

Data Element Name or Description	Override or Possible Help Codes
Module with Problem	BR@HQ: Beneficiary Registration at Headquarters BR@BR: Beneficiary Registration at Branch BR@PC: Beneficiary Registration at Polyclinic
Function with Problem	1: Data Entry 2: Report Generation 3: Form Generation
Menu/Screen with Problem	1: Beneficiary Registration — Initial Intake 2: Beneficiary Registration — Visit Screen
Equipment with Problem	1: Monitor 2: Keyboard 3: Terminal 4: Server 5: Modem 6: Printer 7: Router 8: Other
Problem Symptom	1: Terminal Locked 2: Can't Login 3: Can't Enter Correct Response 4: Can't Find Record 5: Data Lost/Data Wrong 6: Data Entry Quit, User Returned Back to Menu 7: Report/Form Did Not Run 8: Printer Did Not Work 9: Telecommunications Problem 10: Policy Issue 11: Suggestion/Enhancement Request 99: Other
Error Message	
Detailed Description of Problem or Enhancement	Unlimited text field
Resolution Code	1: Application Modification Required 2: Software Modification Required
Resolution Note	Unlimited text field

4.3 Reports

Initially, three reports will be available on the automated system: the Problem Status Report, the Problem Statistics Report, and the Resolution Time Statistics Report. These reports are shown in Exhibits 4-7, 4-8, and 4-9 respectively.

The **Problem Status Report** presents a list of open and closed problems every day. Problems on this list will be sorted by priority order, date reported, and problem type. On the open problems section of the report all open problems will be presented. On the closed problems section of the report, problems closed that day will be presented. It is intended that this report will be run daily and weekly. This list can be run for a single branch as well as for all branches.

The **Problem Statistics Report** presents the statistics of all open and closed problems by priority level. Within each category the numbers and percentage representation of problems are broken down by branch and Headquarters. It is intended that this report will be run weekly and monthly.

The **Resolution Time Statistics Report** presents the statistics for problems resolved at the branch, reported to the Headquarters, and resolved at the Headquarters. Problems are broken down by type and within the categories of less than 12 hours, 12-24 hours, 24-48 hours, two to four days, and more than four days.

Other reports can be created as the need and interest arise.

At the branches, the Technical Specialists will be responsible for generating these reports for their facility groupings and the branch Help Desk Coordinator will be responsible for generating an aggregate report weekly and monthly for all facilities in the branch.

At the Headquarters, the Help Desk Specialists will be responsible for generating these reports for their branches and the branch Help Desk Coordinator will be responsible for generating an aggregate report weekly and monthly for all branches.

**Exhibit 4-7
PROBLEM REPORT**

OPEN PROBLEMS AS OF 1 FEBRUARY, 1996

Priority	Date Reported	Days Open	Type	ID #	Module	Description	Location	Date Resolved
1	30/01/96	3	Bug	1287	BR@BR	DOB not accepting dates prior to 1940	Canal Branch	
1	31/01/96	2	Bug	1289	CA@BR	Unable to generate Outstanding Accounts Report	Cairo Branch	
1	31/01/96	2	HW	1281		Broken terminal	El Ferdous PC	
2	31/01/96	2	User Error	1280	ADT@Hspt.	Deleted user	El Azmy Hospital	
2	02/02/96	1	Op. Error	1284	BR@PC	Incorrect markaz table downloaded	Shoubra PC	
Enh	01/02/96	1	Enh.	1283	CA@BR	Allow direct movement to beneficiary ID	Cairo Branch	

CLOSED PROBLEMS ON 1 FEBRUARY, 1996

Priority	Date Reported	Days Open	Date Resolved	Type	ID #	Module	Location	Description
1	30/01/96	3	01/02/96	Bug	1287	BR@BR	East Delta Branch	Not accepting registration date of 96/2/1
1	31/01/96	2	01/02/96	Bug	1289	CA@BR	East Delta Branch	Unable to generate Paid Accounts Report
1	31/01/96	2	01/02/96	Tele.	1280		Kafr El Dawar PC	X.25 down
2	31/01/96	2	01/02/96	User Error	1281	PR@PC	Abdeen PC	Generated multiple reports for same ID
2	01/02/96	1	01/02/96	Op. Error	1283	BR@BR	NWDB	Entered incorrect but valid value for beneficiary employer

Exhibit 4-8
PROBLEM STATISTICS REPORT

AS OF 1 FEBRUARY, 1996

Problem Priority/Status	Number	Percentage of Subtotal	Percentage of Total	Percentage of Grand Total
Opened Last Week				
Priority 1				
Cairo Branch	15	38.46%		
NWDB	10	25.64%		
Headquarters	14	35.90%		
Subtotal	39		54.17%	
Priority 2				
Cairo Branch	5	15.15%		
NWDB	12	36.36%		
Headquarters	16	48.48%		
Subtotal	33		45.83%	
TOTAL	72			52.17%
Closed Last Week				
Priority 1				
Cairo Branch	6	21.43%		
NWDB	10	35.71%		
Headquarters	12	42.86%		
Subtotal	28		42.42%	
Priority 2				
Cairo Branch	8	21.05%		
NWDB	11	28.95%		
Headquarters	19	50.00%		
Subtotal	38		57.58%	
TOTAL	66			47.83%

Problem Priority/Status	Number	Percentage of Subtotal	Percentage of Total	Percentage of Grand Total
GRAND TOTAL	138			

Exhibit 4-9
RESOLUTION TIME STATISTICS REPORT (ALL PROBLEMS)

FOR WEEK BEGINNING 1 FEBRUARY, 1996

Problem Type	<12 hrs	12-24 hrs	24-48 hrs	2-4 days	> 4 days
Resolved at Branch					
User Errors	5	10	12	5	3
Operational Errors	7	15	25	30	6
TOTAL	12	25	37	35	9
Reported to Headquarters					
User Errors	2	5	1	1	0
Operational Errors	12	5	3	0	0
Bugs	8	3	1	0	0
Enhancements	2	2	1	1	0
TOTAL	24	15	6	2	0
Resolved at Headquarters					
User Errors	4	2	1	0	0
Operational Errors	2	10	15	5	1
Bugs	0	1	1	2	3
TOTAL	6	13	17	7	4

5 IMPLEMENTATION PLAN

The implementation of the help desk activities should begin immediately following approval of the plan and should coordinate with the MIS implementation date for each site. Help desk specific implementation activities include:

- o informing appropriate staff of their roles regarding the help desk activities;
- o telling all end users who they should contact when they need help;
- o designing, developing, and implementing the automated help desk tracking system;
- o training on the automated system;
- o instituting monthly meetings with the Computer Operators and their responsible Technical Specialists—End User Support; and
- o establishing the MIS Steering Committee to provide guidance for the HIO MIS and for implementing requested enhancements.

It is anticipated that the first few months of use of the HIO MIS will generate the most need for the help desk. It is for this reason that instituting the help desk function and reporting path should be a part of the overall implementation activities of the facilities. In addition, since the Branch Computer Departments and HQ MIS Center staff are directly involved in providing help desk support, they should be introduced to their new roles in the help desk structure as soon as practical.

6 CONCLUSIONS AND RECOMMENDATIONS

The help desk is a vital component of a successful and sustainable management information system. Help desk procedures must be implemented as soon as possible. Users should be informed of the help desk procedures and help desk staff should be assigned in the very near future. These staff should then receive semiannual training on troubleshooting techniques and solutions to commonly-reported problems.

In addition, each member of the help desk staff must have his/her own terminal and access to an X.25 line to connect to any facility in the branch. Each branch help desk must have at least one dedicated phone line to allow Computer Operators at the facilities to contact the branch to report problems. The X.25 lines will also facilitate file transfers required by the help desk procedures.

The help desk will be guided by the goal of resolving all Priority 1 problems within 24 hours of being reported and of resolving all Priority 2 problems within 48 hours of being reported. Meeting these time frames will require strict adherence to the procedures described in this document. It will require that problems be reported to the branch and then to the Headquarters as soon as it is apparent that additional technical assistance is required to resolve them.

If the above recommendations are followed, the HIO can use the MIS system it is investing in to its fullest capacity. This plan ensures that the MIS can be operational 99% of the time and that any problems encountered will be resolved in an efficient and successful manner.

APPENDIX A: CONFIGURATION/VERSION CONTROL

This configuration/version control plan outlines the steps required to download software modifications to sites requiring them. This plan ensures that a highly-efficient and quality process is in place to update sites with new or modified software versions.

Configuration/version control is attained through the efforts of the Help Desk Specialists and Computer Operators at each of the sites: Headquarters (HQ), branches, and facilities. Ultimately, however, accountability for configuration/version control rests with the HQ Help Desk Specialists. They are the best suited to do this job for several reasons. They have:

- o proximity to development staff (analysts and programmers),
- o proximity to documentation specialists,
- o proximity to training specialists,
- o the best qualifications as help desk personnel, and
- o access to the entire network.

The process of configuration/version control is systematic and proceduralized. Initially, a request to distribute a bug fix, an enhancement, or expanded system capability must be made by the system analyst responsible for a particular module. The system analyst must submit in writing a request to the HQ Help Desk Specialist for an Update Request Form (Exhibit A-1). This form indicates the nature of the requested update, special considerations to be taken during implementation, and areas or staff that must approve the update before it can be implemented.

Next, the Update Request Form is assigned a serial number by the HQ Help Desk Specialist. The serial number is written on the Update Request Form. This serial number is important, as it is the mechanism for storing updates online and providing a means for looking up the status of each update at each facility on the HQ Updates Logfile (Exhibit A-2).

All programs, objects, and source code related to the update are placed in a subdirectory under the user directory of the system analyst submitting the Request Update Form. The name of this subdirectory must correspond to the serial number issued by the HQ Help Desk Specialist on the Request Update Form. For example, updates for serial #00016 by Ayman are placed in /home6/ayman/00016. The HQ Help Desk Specialists then execute a series of scripts (Exhibit A-3) to move the programs, objects, and related

source code from the system analyst's environment to the help desk staging area. The directory structure required for this migration is presented in Exhibit A-4.

Exhibit A-1
UPDATE REQUEST FORM

Update Request

Serial No.: _____ Requested by: _____
System: _____ Authorization: _____
Version: _____ A.D.M. Approval: _____
Computer: _____ Date: _____

Type of update: ☐ Database changes ☐ Data changes ☐ Program/Library change

Request: _____

File Names	Attributes	Comments

Please state clearly all the objects involved.

Modification Date: _____ By: _____
Delivery Date: _____ By: _____

Effect on User Manual? If yes,

Modification Date:

By:

Delivery Date:

By:

Effect on Functional Design Manual? If yes,

Modification Date:

By:

Delivery Date:

By:

Effect on Detailed Design Manual? If yes,

Modification Date:

By:

Delivery Date:

By:

HQ Updates Logfile

[illegible]

Exhibit A-3
HEADQUARTERS SCRIPTS

Shell Script	Parameters	Description
usrupdates	<developer><serial no>	Copy the requested update objects from development to a staging area.
beapproved	<serial no><schema>	Copy the requested update objects from the staging area to the simulated production environment for final sign off.
replists	<schema>	Generate lists by object type that identify all of those object types associated with the current update.
gencomm	<schema><passwd>	Generate a UNIX command file with the appropriate instructions to automatically implement the updates at the sites.
becompressed	<schema>	Bundle objects for an update into one compressed object.
besento	<node><schema>	Send the compressed update object to the required sites.
archive	<schema>	Archive in compressed format the bundled objects for an update.
beok	<schema>	Remove transmitted files from the update directory.

Exhibit A-4
DIRECTORY STRUCTURE

Directory Name	Purpose/Description
/home6/<System Analyst>/<Serial Number>	Directory for system analysts to place all programs and source that are to be released.
/home6/hio/updates/src/c	Source directory for 'C' programs.
/home6/hio/updates/src/sqlfrm	Source directory for SQL*Forms.
/home6/hio/updates/src/sqlrep	Source directory for SQL*Reports.
/home6/hio/updates/src/sqlmnu	Source directory for SQL*Menus.
/home6/hio/updates/src/shell	Source directory for shell scripts.
/home6/hio/updates/<Serial Number>	Staging directory for Help Desk to review programs and source.
/home6/hio/updates/<headqtr branch clinic hospital stores>	Staging directory for approved updates to be prepared for transmission.
/home6/hio/updates/tools	Directory for Help Desk programs that are used to automate the release process.

Once the requested programs, objects, and source code are in the help desk staging directories, the Help Desk Specialists must verify that all of the programs and corresponding source files, menu scripts, database scripts, and shell scripts are present. Next, the Help Desk Specialists must get signed approval for this release from the documentation, training, and development managers. There are spaces on the Update Request Form for these signatures.

Once confirmation of the release is obtained, the update is moved from the help desk staging area to a "support" production environment where system-wide integration tests are conducted. At the same time, the implementation process is reviewed by the system analyst making the update request and the Help Desk Specialist implementing the request. If no problems are encountered, the Update Request is then approved by the Help Desk Coordinator for general release.

The means of transmitting changes from Headquarters to each of the "live" production sites is the telecommunications network. A tape cartridge is used in the event that the network is unavailable. In either case, the release is placed in a staging area at the "live" production site. The HQ Help Desk Specialist then executes three programs (Exhibit A-5) to implement the update and monitor for any error messages.

Exhibit A-5 PRODUCTION SCRIPTS

Shell Script	Parameters	Description
beuncompressed	<schema>	Uncompress the bundled objects
unixcomm		The generated UNIX script to automatically implement the update on site
allok		Remove sent files from the 'updates' directory

In the future, the three programs will be executed from a single driver and the call to this driver will be placed into CRON. The purpose for using this approach is to provide all sites with the possibility of receiving software updates on the same date. **Note: Use of this approach requires that the update be placed in the production staging area at least one week prior to the implementation date set in CRON. In the event of difficulties in staging the update, there is sufficient time to resolve the problem.**

Error messages are kept in logging files on the production machine, but will be sent to the HQ Help Desk Specialists by means of the UNIX "mailx" utility. However, the primary resource for verifying a successful update is the Branch Help Desk Specialists, who need to sign on to each site under their control to review the logging files. If the network is down, then it becomes the responsibility of the facility Computer Operator to review the logging files and to

submit a Software Updates Completion form, shown in Exhibit A-6, to the Branch Help Desk Specialists.

Exhibit A-6
SOFTWARE UPDATES COMPLETION FORM

Software Updates Completion Form

Update Request Archive No. : _____

Side code : _____

Side Name : _____

Responsible Person : _____

Date : __/__/__

Notes: _____

After each update, the Branch Help Desk Specialists must submit a Software Updates Logfile, shown in Exhibit A-7, to the HQ Help Desk Specialist specifying the status of the update at each of its subordinate sites. These forms are used by the HQ Help Desk Specialists to produce the HQ Updates Logfile, shown in Exhibit A-2, above.

In conclusion, the configuration/version control plan presents a process to monitor and track the software updates required to maintain the HIO MIS. The steps outlined in this plan require that they be followed consistently and in the order presented **each** time a software modification is made and is migrated to the sites. Modifications to this plan should be made when needed to improve the efficiency and quality control of the version control process.

